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Comparison of periodontal status among pregnant and non-pregnant women

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ABSTRACT

Since the 1960s, there has been a rise in the prevalence and severity of inflammation of gingiva during pregnancy. Though the reason of incidence isn't entirely fathomed, it is believed that the increase in the sex hormone levels in the plasma during pregnancy have a substantial effect on the periodontium. The aim of this study was to assess the periodontal health of women who were pregnant. This retrospective study was conducted among pregnant women who visited a private dental college in Chennai from June 2019 to March 2020. A total of 242 pregnant women were randomly enrolled. Data regarding the patient's periodontal status were cumulated from the case records and analysed. Descriptive statistics and inferential statistics were done using SPSS software, Version 23. Among the 249 patients 162 patients (66.94%) exhibited generalised chronic gingivitis, 56 patients (23.14%) exhibited clinically healthy gingiva and 24 patients (9.92%) exhibited generalised chronic periodontitis. Clinically healthy gingiva was highly prevalent among 30 year old pregnant women. Gingivitis was highly prevalent among 28 year old patients and periodontitis was most prevalent among 20 and 24 year old patients. Also, the association between age and periodontal status among pregnant women was found to be statistically significant (p value=0.006).

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INTRODUCTION

Periodontitis is the chronic disease of inflammatory nature of the periodontium. In advanced forms it is characterised by loss of surrounding bone and destruction of the periodontal ligament (De Pablo *et al.*, 2009). It is the main cause of tooth loss and is considered one of the two biggest threats to oral health (Benjamin, 2010). The World Health organisation has defined periodontal disease as a state in which an individual is free from periodontal disease of inflammatory nature which permits the individual to function normally and avoid any effect due to past or current diseases (Khalid *et al.*, 2017).

The incidence of gingival changes is primarily linked to hormonal changes during pregnancy. Pregnancy gingivitis is predominantly associated to increased levels of female sex hormones (Lindhe and Branemark, 1967). Pregnancy hormones oestrogen and progesterone induce a tissue reaction by acting on the local tissue and it's microvascular system. It essentially reduces the threshold level for tissue injury and causes endothelial injury,

increased vascular permeability and reduced capsular flow (Lindhe and Branemark, 1967).

Gingivitis involves the inflammation of the dental soft tissue only with no evidence of apical migration of the junctional epithelium (Thamaraiselvan *et al.*, 2015). It is characterized by redness, oedema and bleeding on probing. When treated at an appropriate state, gingivitis is reversible and shows no permanent damage. When untreated it may lead to a more extensive and devastating condition known as chronic periodontitis (Avinash *et al.*, 2017). Periodontitis is the primary reason which results in tooth loss. Children and adolescents may present with several forms of periodontitis as described in the proceedings of the 1999 International Workshop for a Classification of Periodontal Diseases and Conditions (aggressive periodontitis, chronic periodontitis, and periodontitis as a manifestation of systemic diseases). However, chronic periodontitis is more common in adults, while aggressive periodontitis is mainly associated with children and adolescents (Armitage, 1999).

The present study aims to assess the periodontal health among pregnant women.

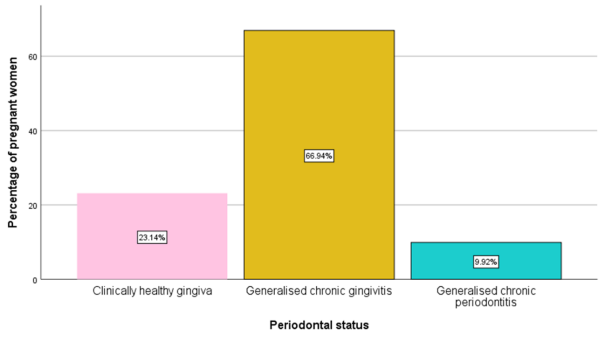

Figure 1: The most prevalent periodontal condition was generalised chronic gingivitis.

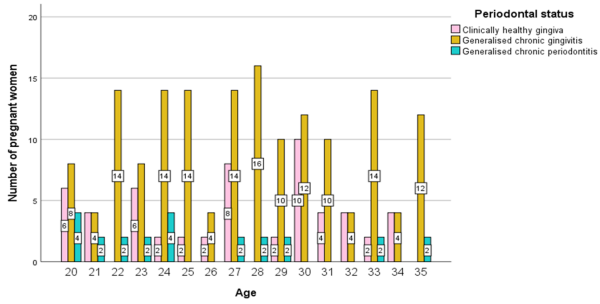

Figure 2: From this graph it can be inferred that generalised chronic gingivitis.

MATERIALS AND METHODS

This retrospective study was conducted among pregnant women who visited a private dental college in Chennai from June 2019 to March 2020. Prior permission to utilise the data for the and analysis was obtained from the Institution Ethics Board with the ethical approval number being: SDC/SIHEC/2020/DIASDATA/0619-0320.

A total of 242 pregnant women were randomly recruited. Patients with systemic illness and those who were on long term medications were excluded from the study. Data regarding the patient's periodontal status were collected from the case records and analysed. Descriptive (frequency distribution and percentage) and inferential statistics (chi-square test) were done using SPSS software by IBM, Version 23.

RESULTS AND DISCUSSION

A total of 242 pregnant women were enrolled and their periodontal status was assessed in the present study. Among the 242 patients, 162 patients (66.94%) exhibited generalised chronic gingivitis, 56 patients (23.14%) exhibited clinically healthy gingiva and 24 patients (9.92%) exhibited generalised chronic periodontitis Figure 1.

The periodontal status was assessed based on age. Clinically healthy gingiva was highly prevalent among 30 year old pregnant women. Gingivitis was highly prevalent among 28 year old patients and periodontitis was most prevalent among 20 and 24 year old patients. The association between age and the periodontal health among pregnant women was analysed using chi-square test and was found to be statistically significant with the p-value of 0.006 Figure 2.

The present study evaluated the periodontal health of women who were pregnant. It was seen that gingivitis showed a higher prevalence when compared to periodontitis. It can be observed that there was a positive association between the two. Patil *et al.* (2018) stated that Gingivitis was prevalent in almost all the pregnant and nonpregnant women. However, it was found more severe in pregnant women with mean gingival score as 1.25. A definite increase in gingivitis was found from Trimester II to Trimester III. Wu *et al.* (2015) suggested that the variation in the levels of oestrogen and progesterone during the gestation period exerts an influence on the microbiota in the subgingival region. This results in a range of inflammatory feedbacks in gingival tissues mediated through the changes in enzymes, cytokines, chemotaxis, and antioxidants from GFs, PMNs, and PDLCs and thus indirectly contributes to increased gingival inflammation. 100% prevalence of pregnancy gingivitis was reported by Löe (1965).

These conclusions are in accordance with our study.

In the current study, clinically healthy gingiva was highly prevalent among 30 year olds. Gingivitis was highly prevalent among 28 year old patients and periodontitis was most prevalent among 20 and 24 year old patients. A study by Onigbinde *et al.* (2014), suggested that the age group 20–24 years had the highest score of healthy gingiva which is contradictory to our results. This study however, showed no statistical significance between the age and the periodontal health of the pregnant patient. A study by Mullany (2019) suggested that odds of gingivitis increased by 3% for each year of age and that statistically there was a positive association between age and gingivitis among pregnant women with the mean age of the population being 24.5 years. Moss *et al.* (2005) assessed the risks for the occurrence and progression of gingivitis/periodontitis during pregnancy and stated that the sites with PPD $\geq$ 4 mm and BOP had a greater probability of suffering an increase in PPD and CAL during pregnancy.

The findings of the recent studies further established that the gingival inflammation seen during pregnancy was dependent on the amount of dental plaque that was accumulated but not directly related to it Armitage (1999). It was noticed that the hormonal effects were neutralised with the inculcation of good oral hygiene practices during pregnancy (Klinger *et al.*, 1998). Pregnancy only acts as an aggravating factor of preexisting condition of gingivitis but not a causative reason (Tsai and Chen, 1995).

Therefore, the present study showed that gingivitis (66.4%) was highly prevalent among pregnant women when compared to clinically healthy gingiva (23.14%) and periodontitis (9.92%).

Figure 1 shows, (Yellow) which constituted to 66.94%, followed by clinically healthy gingiva (Pink) which constituted to 23.14% and Generalised chronic periodontitis (Blue) which constituted to 9.92%.

Figure 2 shows, (16) was more prevalent among 28 year old patients, clinically healthy gingiva(10) was more prevalent among 30 year old patients and generalised chronic periodontitis(4) was more prevalent among 20 and 24 year old patients.

CONCLUSION

Within the limitations of the present study it can be concluded that gingivitis (66.4%) was highly prevalent among pregnant women when compared to clinically healthy gingiva (23.14%) and periodontitis (9.92%). This strong association between pregnancy and gingivitis shows the importance of raising awareness among pregnant women to maintain oral hygiene cautiously especially before and during pregnancy.

Authors contribution

Geethika. B performed the analysis, and interpretation and wrote the manuscript. Arvina Rajasekar contributed to conception, data design analysis, interpretation and critically revised the manuscript. Manjary Chaudhary participated in the study and revised the manuscript. All the authors have discussed the results and contributed to the final manuscript.

Conflict of interest

The authors declare that they have no conflict of interest for this study.

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